PILOT STUDY DESIGN

EFFECT OF INDIRECT PREPARATION ON LA STRUCTURE COUNT IN AIR SAMPLES FROM LIBBY, MT

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1.0 INTRODUCTION

At the Libby, Montana, Superfund site, most samples of air analyzed for Libby amphibole (LA) by transmission electron microscopy (TEM) are evaluated using a direct preparation method. However, some air samples contain sufficient levels of dust and other debris that an indirect preparation is needed to reduce the total loading on the filter for TEM examination. One potential limitation to an indirect preparation is that suspending the sample in water may cause some asbestos structures to disaggregate into smaller structures, thereby influencing the total number and types of asbestos structures observed. The purpose of this pilot study is to investigate whether indirect preparation does or does not result in a significant change in the number of LA structures counted under TEM.

2.0 PILOT STUDY DESIGN

Sample Selection

The pilot study will be performed on a set of 35 air samples from Libby. These samples were selected from the set of all air samples already collected at the site and which have already been analyzed by TEM-AHERA using a direct preparation method. Samples analyzed originally by TEM-AHERA were selected because any disaggregation of complex structures that may be caused by the indirect preparation is more likely to be observable using AHERA counting rules than ISO 10312 counting rules. Because the purpose of this pilot study is to compare air concentrations between the two preparation methods, the selected air samples were restricted to air samples in which LA has been detected (as determined based on the direct preparation results). Because the uncertainty in air concentration is directly related to the total number of structures observed (i.e., as N increases, the relative uncertainty decreases), samples with more than 10 LA structures observed in 10 or fewer grid openings were selected preferentially. Because the indirect preparation requires ½ of the original filter (see below), only samples that have ½ or more of the original filter available for re-analysis were considered. The amount of filter remaining was estimated from the database by assuming that ¼ of the filter was used for each type of analysis performed. For example, for a sample that had been analyzed by PCM and by TEM-AHERA, it was assumed that ½ of the filter would remain.

A total of 77 samples were identified which met the selection criteria above. These are listed in Table 1. Of these 77 samples, 35 samples were selected for re-analysis using indirect preparation. These 35 were selected at random, seeking to include samples from a variety of different locations around the site. Table 2 identifies the 35 air samples that were selected. If for any reason one or more of these samples can not be located or is otherwise considered unsuitable for use, any other sample from Table 1 may be substituted.

Sample Preparation

For each sample identified for indirect preparation, the original sample filter will be obtained from archive storage. If more than ½ of the original sample filter is available, ½ of the primary

filter will be used in the indirect preparation, and the remaining fraction of original filter will be saved for future reference. If only ½ of the original filter is available, all of the filter will be used in the preparation[1]. The portion of the primary filter will be suspended in about 50 mL of filtered deionized (FDI) water in a graduated cylinder. In order to ensure that any structures that may have come off the filter during transport of storage are recovered, the inside of the cassette (filter removed) will then be rinsed with about 25-50 additional mL of FDI water, which will be added to the graduated cylinder. The entire volume of water (75-100 mL) will be applied to the secondary filter, which will be equal in diameter to the primary filter (typically 25 mm^2). This procedure will result in an F-factor of 0.5.

Counting and Stopping Rules

All indirect preparations will be prepared for TEM examination as usual. Samples will be counted using the same AHERA counting rules as were used during the original analysis. That is, all LA structures that are at least 0.5 um long and have an aspect ratio of 5:1 or greater will be recorded. The number of grid openings analyzed in the indirect analysis will be twice the number analyzed in the original (direct) analysis (see Table 2).

Data Recording

Data will be recorded in the most recent version of the TEM spreadsheet for analysis of air and dust samples. The sample comment field on the TEM spreadsheet should identify that the sample was evaluated as part of the indirect preparation pilot study (e.g., "Indirect Pilot Study").

3.0 DATA EVALUATION

The LA air concentration from the indirect preparation will be compared to the LA air concentration from the direct preparation for the same sample. The comparison will be based on an evaluation of the ratio of the concentrations (indirect *vs* direct), as well as the method for comparison of two Poisson rates described by Nelson (1982). In addition, the frequency of occurrence of each type of structure classification (fiber, bundle, cluster, matrix) will be compared between the two types of preparation methods for the same sample. These results are expected to allow a determination as to the effect of indirect preparation on LA asbestos particles.

[1] While EPA prefers to always retain a fraction of the original filter for re-analysis if needed, the goals of this study were considered to be sufficiently important that sacrificing the remaining filter for a selected subset of all samples was considered acceptable.

TABLE 1 LIST OF CANDIDATE SAMPLES

Index	ISO Analysis Performed	AHERA Analysis Performed	PCM Analysis Performed	Portion of Filter Remaining (a)	selected for pilot study	Property Description	Indoor/ Outdoor	Personal/ Stationary	Field ID	Media	Analysis Method	Prep Method	Analysis Date	GO Size (mm2)	GO Counted	EFA (mm2)	F-Factor	Air Volume (L)	Analytical Sensitivity (s/cc)	Lab Name	Lab Job Number	Lab Sample ID	Total NLA Str	LA Loading (s/mm2)	LA Air Conc (s/cc)
1		X		0.75	1	100 W. 2nd St	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	23-Jun-03	0.013	9	385	1	1474	[illegible]	Mobile Lab	[illegible]	[illegible]	16	[illegible]	[illegible]
2		X		0.75	1	100 W. 2nd St	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	23-Jun-03	0.013	9	385	1	1376	[illegible]	Mobile Lab	[illegible]	[illegible]	13	700	[illegible]
3		X	X	0.5	1	1311 Gallatin Ave	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	24-May-03	0.013	10	385	1	171	[illegible]	Mobile Lab	[illegible]	[illegible]	30	[illegible]	[illegible]
4		X	X	0.5	1	1311 Gallatin Ave	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	24-May-03	0.013	10	385	1	91	[illegible]	Mobile Lab	[illegible]	[illegible]	29	[illegible]	[illegible]
5		X	X	0.5	1	120 S. Central Rd	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	21-Aug-02	0.0129	10	385	1	423	[illegible]	Mobile Lab	[illegible]	[illegible]	23	[illegible]	[illegible]
6		X	X	0.5	1	120 S. Central Rd	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Aug-02	0.0129	10	385	1	143	[illegible]	Mobile Lab	[illegible]	[illegible]	31	[illegible]	[illegible]
7		X	X	0.5	1	120 S. Central Rd	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	20-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	21	[illegible]	[illegible]
8		X	X	0.5		120 S. Central Rd	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	20-Aug-02	0.0129	9	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	30	[illegible]	[illegible]
9		X	X	0.5		120 S. Central Rd	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Aug-02	0.0129	10	385	1	143	[illegible]	Mobile Lab	[illegible]	[illegible]	20	[illegible]	[illegible]
10		X		0.75	1	400 Pipe Creek Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	14-Apr-03	0.013	9	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	12	[illegible]	[illegible]
11		X	X	0.5	1	Plywood Site	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	30-Aug-04	0.013	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	15	[illegible]	[illegible]
12		X	X	0.5	1	KDC Bluffs	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	05-Sep-01	0.0129	10	385	1	618	[illegible]	Mobile Lab	[illegible]	[illegible]	20	[illegible]	[illegible]
13		X	X	0.5	1	KDC Bluffs	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	08-Sep-01	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	18	[illegible]	[illegible]
14		X	X	0.5	1	KDC Flyway	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	24-Jul-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	18	[illegible]	[illegible]
15		X	X	0.5	1	KDC Flyway	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	24-Jul-02	0.0129	10	385	1	190	[illegible]	Mobile Lab	[illegible]	[illegible]	15	[illegible]	[illegible]
16		X	X	0.5	1	Lincoln County Landfill	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	[illegible]	0.013	6	385	1	294	[illegible]	Mobile Lab	[illegible]	[illegible]	51	[illegible]	[illegible]
17		X	X	0.5	1	Lincoln County Landfill	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Mar-04	0.0121	10	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31	[illegible]	[illegible]
18		X	X	0.5	1	Lincoln County Landfill	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	03-Oct-03	0.013	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	22	[illegible]	[illegible]
19		X	X	0.5		Lincoln County Landfill	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Mar-04	0.0121	10	385	1	101	[illegible]	[illegible]	[illegible]	[illegible]	18	[illegible]	[illegible]
20		X	X	0.5		Lincoln County Landfill	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	31-Jul-03	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	19	152	[illegible]
21		X	X	0.5		Lincoln County Landfill	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	21-Oct-02	0.0131	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	11	[illegible]	[illegible]
22		X	X	0.5	1	[illegible] Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	05-Jun-01	0.0129	2	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22	[illegible]	[illegible]
23		X	X	0.5	1	[illegible] Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	05-Jun-01	0.0129	2	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17	[illegible]	[illegible]
24		X	X	0.5		[illegible] Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	29-May-01	0.0129	4	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14	[illegible]	[illegible]
25		X	X	0.5		[illegible] Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	28-Jun-01	0.0129	4	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17	[illegible]	[illegible]
26		X	X	0.5	1	Rainy Creek [illegible]	Indoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	15-Jul-03	0.0125	13	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	24	182	[illegible]
27		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	03-Oct-03	0.013	4	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	54	[illegible]	[illegible]
28		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	25-Aug-03	0.0125	8	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	54	[illegible]	[illegible]
29		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	07-Oct-03	0.013	8	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	50	[illegible]	[illegible]
30		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	15-Aug-02	0.0129	9	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	48	[illegible]	[illegible]
31		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	28-Aug-03	0.0125	10	385	1	384	[illegible]	Mobile Lab	[illegible]	[illegible]	42	[illegible]	0.43
32		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	31-Jul-03	0.0125	10	385	1	277	[illegible]	Mobile Lab	[illegible]	[illegible]	40	[illegible]	[illegible]
33		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	20-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
34		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	03-Sep-02	0.0129	10	385	1	344	[illegible]	Mobile Lab	[illegible]	[illegible]	37	[illegible]	[illegible]
35		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	25-Jul-03	0.0125	10	385	1	279	[illegible]	Mobile Lab	[illegible]	[illegible]	33	[illegible]	[illegible]
36		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	20-Aug-03	0.0129	10	385	1	613	[illegible]	Mobile Lab	[illegible]	[illegible]	33	[illegible]	[illegible]
37		X	X	0.5	1	Rainy Creek Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	08-Jun-01	0.0129	[illegible]	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31	[illegible]	[illegible]
38		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	28-Aug-03	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	31	[illegible]	[illegible]
39		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Aug-02	0.0129	10	385	1	61	[illegible]	Mobile Lab	[illegible]	[illegible]	31	[illegible]	[illegible]
40		X	X	0.5	1	Rainy Creek Rd	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	08-Jun-01	0.0129	4	385	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	28	[illegible]	[illegible]
41		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	15-Aug-02	0.0129	13	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	28	[illegible]	[illegible]
42		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	21-Aug-03	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	23	[illegible]	[illegible]
43		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	31-Jul-03	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	28	[illegible]	[illegible]
44		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	18-Jul-03	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	24	182	[illegible]
45		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Aug-02	0.0129	10	385	1	63	[illegible]	Mobile Lab	[illegible]	[illegible]	24	[illegible]	[illegible]
46		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	24-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	24	[illegible]	[illegible]
47		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	08-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	23	[illegible]	[illegible]
48		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	21-Aug-02	0.0129	10	385	1	304	[illegible]	Mobile Lab	[illegible]	[illegible]	22	[illegible]	[illegible]
49		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	16-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	21	[illegible]	[illegible]
50		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	16-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	20	[illegible]	[illegible]
51		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	28-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	20	[illegible]	[illegible]
52		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	13-Aug-02	0.0129	10	385	1	417	[illegible]	Mobile Lab	[illegible]	[illegible]	20	[illegible]	[illegible]
53		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Aug-02	0.0129	10	385	1	77	[illegible]	Mobile Lab	[illegible]	[illegible]	19	[illegible]	[illegible]
54		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	13-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	19	[illegible]	[illegible]
55		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	10-Aug-02	0.0129	10	385	1	219	[illegible]	Mobile Lab	[illegible]	[illegible]	18	[illegible]	[illegible]
56		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	14-Aug-02	0.0129	10	385	1	413	[illegible]	Mobile Lab	[illegible]	[illegible]	18	[illegible]	[illegible]
57		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	14-Sep-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	17	[illegible]	[illegible]
58		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	13-Aug-02	0.0129	8	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
59		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	21-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	15	[illegible]	[illegible]
60		X	X	0.5	1	Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	23-Aug-02	0.0129	10	385	1	317	[illegible]	Mobile Lab	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
61		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	21-Aug-02	0.0129	10	385	1	81	[illegible]	Mobile Lab	[illegible]	[illegible]	15	[illegible]	[illegible]
62		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	31-Jul-03	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	13	101	[illegible]
63		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	24-Aug-02	0.0129	10	385	1	63	[illegible]	Mobile Lab	[illegible]	[illegible]	13	[illegible]	[illegible]
64		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	08-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	13	[illegible]	[illegible]
65		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	29-Aug-02	0.0129	10	385	1	344	[illegible]	Mobile Lab	[illegible]	[illegible]	12	[illegible]	[illegible]
66		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	29-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	12	[illegible]	[illegible]
67		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	13-Aug-02	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	12	[illegible]	[illegible]
68		X		0.75		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	10-Aug-02	0.0129	10	385	1	611	[illegible]	Mobile Lab	[illegible]	[illegible]	11	[illegible]	[illegible]
69		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	15-Aug-02	0.0129	10	385	1	61	[illegible]	Mobile Lab	[illegible]	[illegible]	11	[illegible]	[illegible]
70		X	X	0.5		Rainy Creek Rd	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	14-Aug-02	0.0129	11	385	1	401	[illegible]	Mobile Lab	[illegible]	[illegible]	11	[illegible]	[illegible]
71		X	X	0.5		Rainy Creek Rd - B Frontage	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	19-Aug-04	0.013	10	385	1	115	[illegible]	Mobile Lab	[illegible]	[illegible]	48	[illegible]	[illegible]
72		X	X	0.5	1	Screening Plant	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	25-Jun-01	0.0129	7	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
73		X	X	0.5	1	Screening Plant	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	26-Jun-01	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	17	[illegible]	[illegible]
74		X	X	0.5		Screening Plant	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	26-Jun-01	0.0129	7	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
75		X	X	0.5	1	Screening Plant	Outdoor	Stationary	[illegible]	Air	TEM-AHERA	DIRECT	26-Jun-01	0.0129	4	385	1	1720	[illegible]	Mobile Lab	[illegible]	[illegible]	15	[illegible]	[illegible]
76		X	X	0.5	1	Screening Plant Flyway	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	17-Aug-01	0.0129	8	385	1	[illegible]	[illegible]	EMSL	[illegible]	[illegible]	33	[illegible]	[illegible]
77		X	X	0.5	1	Screening Plant Flyway	Outdoor	Personal	[illegible]	Air	TEM-AHERA	DIRECT	[illegible]	0.0129	10	385	1	[illegible]	[illegible]	Mobile Lab	[illegible]	[illegible]	17	[illegible]	[illegible]

(a) It was assumed that 1/4 of the filter was used for each type of analysis already performed.

Table 2
Selected Samples for Indirect Preparation

SAMPLE INFORMATION				ANALYSIS INFORMATION									RESULTS		
Index ID	Property Description	Media Description	Volume (L)	Lab	Lab Sample ID	Analysis Date	Analysis Method	Prep Method	GO Counted	GO Size (mm^2)	Primary Filter Area (mm^2)	Analysis Sensitivity (s/cc)	Primary Filter Loading (s/mm^2)	Total N LA Structures	LA Air Conc. (s/cc)
IR-31263	105 W. 2nd St	Outdoor, Stationary	1,376	Mobile Lab	270500592-0001	6/23/2005	AHERA	Direct	5	0.013	385	4.3E-03	200	13	5.6E-02
IR-31264	105 W. 2nd St	Outdoor, Stationary	1,474	Mobile Lab	270500592-0002	6/23/2005	AHERA	Direct	5	0.013	385	4.0E-03	246	16	6.4E-02
IR-29025	1511 Gallatin Ave	Indoor, Personal	61	Mobile Lab	270500410-0001	5/24/2005	AHERA	Direct	10	0.013	385	4.9E-02	223	29	1.4E+00
IR-29026	1511 Gallatin Ave	Outdoor, Stationary	131	Mobile Lab	270500410-0002	5/24/2005	AHERA	Direct	10	0.013	385	2.3E-02	292	38	8.6E-01
IR-14570	156 S. Central Rd	Indoor, Personal	665	Mobile Lab	270200220-0010	8/20/2002	AHERA	Direct	10	0.0129	385	4.5E-03	163	21	9.4E-02
IR-14574	156 S. Central Rd	Outdoor, Stationary	423	Mobile Lab	270200224-0001	8/21/2002	AHERA	Direct	10	0.0129	385	7.1E-03	178	23	1.6E-01
IR-14553	156 S. Central Rd	Indoor, Personal	149	Mobile Lab	270200212-0009	8/17/2002	AHERA	Direct	0.0129	10	385	2.0E-02	163	21	4.2E-01
IR-28513	4000 Pipe Creek Rd	Outdoor, Stationary	1,290	Mobile Lab	270500008-0003	1/14/2005	AHERA	Direct	5	0.013	385	4.6E-03	185	12	5.5E-02
FL-00539	Flyway Site	Outdoor, Personal	576	Mobile Lab	270400643-0006	8/30/2004	AHERA	Direct	10	0.013	385	5.1E-03	115	15	7.7E-02
IR-08836	KDC Bluffs	Outdoor, Stationary	661	Mobile Lab	ML01920-19494	9/6/2001	AHERA	Direct	10	0.0129	385	4.5E-03	147	19	8.6E-02
IR-08838	KDC Bluffs	Outdoor, Personal	615	Mobile Lab	ML01920-19496	9/6/2001	AHERA	Direct	10	0.0129	385	4.9E-03	155	20	9.7E-02
IR-14215	KDC Flyway	Outdoor, Personal	366	Mobile Lab	270200165-0001	7/24/2002	AHERA	Direct	10	0.0129	385	8.2E-03	140	18	1.5E-01
IR-14217	KDC Flyway	Outdoor, Stationary	190	Mobile Lab	270200165-0003	7/24/2002	AHERA	Direct	10	0.0129	385	1.6E-02	116	15	2.4E-01
IR-23369	Lincoln County Landfill	Outdoor, Personal	294	Mobile Lab	270301071-0003	10/8/2003	AHERA	Direct	5	0.013	385	2.0E-02	785	51	1.0E+00
IR-23372	Lincoln County Landfill	Outdoor, Personal	60	Mobile Lab	270301071-0006	10/8/2003	AHERA	Direct	10	0.013	385	4.9E-02	169	22	1.1E+00
IR-24701	Lincoln County Landfill	Outdoor, Stationary	150	Westmont	040404536-0002	3/17/2004	AHERA	Direct	10	0.0121	385	2.1E-02	256	31	6.6E-01
IR-04984	Mine Rd	Outdoor, Stationary	4,515	Westmont	040107965-0003	6/5/2001	AHERA	Direct	2	0.0129	385	3.3E-03	853	22	7.3E-02
IR-04985	Mine Rd	Outdoor, Stationary	4,950	Westmont	040107965-0004	6/5/2001	AHERA	Direct	2	0.0129	385	3.0E-03	659	17	5.1E-02
IR-21585	Rainy Creek Bank	Indoor, Personal	230	Mobile Lab	270300759-0014	7/18/2003	AHERA	Direct	10	0.0125	385	1.3E-02	192	24	3.2E-01
IR-04986	Rainy Creek Rd	Outdoor, Stationary	4,807	Westmont	040107965-0005	6/6/2001	AHERA	Direct	2	0.0129	385	3.1E-03	1,202	31	9.6E-02
IR-04987	Rainy Creek Rd	Outdoor, Stationary	4,674	Westmont	040107965-0006	6/6/2001	AHERA	Direct	4	0.0129	385	1.6E-03	543	28	4.5E-02
IR-14413	Rainy Creek Rd	Outdoor, Stationary	304	Mobile Lab	270200225-0005	8/21/2002	AHERA	Direct	10	0.0129	385	9.8E-03	171	22	2.2E-01
IR-14416	Rainy Creek Rd	Outdoor, Stationary	623	Mobile Lab	270200218-0004	8/20/2002	AHERA	Direct	10	0.0129	385	4.8E-03	302	39	1.9E-01
IR-14508	Rainy Creek Rd	Outdoor, Stationary	342	Mobile Lab	270200198-0009	8/13/2002	AHERA	Direct	10	0.0129	385	8.7E-03	147	19	1.7E-01
IR-14519	Rainy Creek Rd	Outdoor, Personal	723	Mobile Lab	270200208-0001	8/15/2002	AHERA	Direct	9	0.0129	385	4.6E-03	422	49	2.2E-01
IR-14725	Rainy Creek Rd	Outdoor, Stationary	317	Mobile Lab	270200232-0003	8/23/2002	AHERA	Direct	10	0.0129	385	9.4E-03	116	15	1.4E-01
IR-21599	Rainy Creek Rd	Outdoor, Stationary	225	Mobile Lab	270300763-0013	7/18/2003	AHERA	Direct	10	0.0125	385	1.4E-02	192	24	3.3E-01
IR-21793	Rainy Creek Rd	Outdoor, Personal	270	Mobile Lab	270300802-0003	7/26/2003	AHERA	Direct	10	0.0125	385	1.1E-02	264	33	3.8E-01
IR-22376	Rainy Creek Rd	Outdoor, Stationary	62	Mobile Lab	270300916-0003	8/26/2003	AHERA	Direct	5	0.0125	385	9.9E-02	864	54	5.4E+00
IR-23355	Rainy Creek Rd	Outdoor, Personal	60	Mobile Lab	270301071-0001	10/8/2003	AHERA	Direct	4	0.013	385	1.2E-01	1,038	54	6.7E+00
IR-05349	Screening Plant	Outdoor, Stationary	1,728	Mobile Lab	ML01407-15182	6/20/2001	AHERA	Direct	4	0.0129	385	4.3E-03	291	15	6.5E-02
IR-05584	Screening Plant	Outdoor, Personal	838	Mobile Lab	ML01457-15561	6/28/2001	AHERA	Direct	7	0.0129	385	5.1E-03	598	54	2.7E-01
IR-05585	Screening Plant	Outdoor, Stationary	63	Mobile Lab	ML01457-15562	6/28/2001	AHERA	Direct	10	0.0129	385	1.7E-02	132	17	8.1E-01
IR-07741	Screening Plant Flyway	Outdoor, Personal	839	EMSL	ML01753-17837	8/17/2001	AHERA	Direct	8	0.0129	385	4.4E-03	320	33	1.5E-01
IR-14208	Screening Plant Flyway	Outdoor, Stationary	316	Mobile Lab	270200164-0001	7/23/2002	AHERA	Direct	10	0.0129	385	9.4E-03	93	12	1.1E-01